

WHAT IS CLAIMED IS:

1. A liquid discharge apparatus for discharging a liquid to a medium using a liquid discharge head having a plurality of nozzles for discharging the liquid,

5 comprising:

a discharge amount changing device which can change the amounts of liquid discharged from the respective nozzles of the liquid discharge head independently of each of said plurality of nozzles,

10 said discharge amount changing device including a voltage control device which can change a driving voltage value of a driving pulse to be supplied to each of said plurality of nozzles.

2. The apparatus according to claim 1, wherein said
15 discharge amount changing device changes the driving voltage value with a change in at least one of conditions of a combination of nozzles to be used, the number of nozzles to be used, presence/absence of a faulty nozzle, a direction of relative movement of the
20 head and the medium, and a speed of the relative movement of the head and the medium.

3. A liquid discharge method of discharging a liquid to a medium using a liquid discharge head having a plurality of nozzles for discharging the liquid,
25 comprising:

a step of discharging the liquid from the liquid discharge head which has only nozzles connected to a

discharge amount changing device which can change the amount of liquid discharged from the nozzle by changing a driving voltage value of a driving pulse to be supplied to the nozzle.

- 5 4. A display device panel manufacturing apparatus for manufacturing a display device panel by discharging, onto a substrate, from a liquid discharge head having a plurality of nozzles for discharging the liquid, comprising:
- 10 a discharge amount changing device which can change the amounts of liquid discharged from the respective nozzles of the liquid discharge head independently of each of said plurality of nozzles, said discharge amount changing device including a
- 15 voltage control device which can change a driving voltage value of a driving pulse to be supplied to each of said plurality of nozzles.
5. The apparatus according to claim 4, wherein said discharge amount changing device changes the driving
- 20 voltage value with a change in at least one of conditions of a combination of nozzles to be used, the number of nozzles to be used, presence/absence of a faulty nozzle, a direction of relative movement of the head and the medium, and a speed of the relative
- 25 movement of the head and the medium.
6. A display device panel manufacturing method of manufacturing a display device panel by discharging,

onto a substrate, from a liquid discharge head having a plurality of nozzles for discharging the liquid, wherein

a display device panel is manufactured by
5 discharging the liquid from a liquid discharge head having only nozzles connected to a discharge amount changing device which can change a driving voltage value of a driving pulse to be supplied to a nozzle.

7. A liquid discharge apparatus including a liquid
10 discharge head having a plurality of nozzles including a nozzle whose liquid discharge amount can be changed, comprising:

a discharge amount control device which changes a discharge amount control value including at least one
15 of conditions of a voltage value and pulse width of a driving pulse to be supplied to a predetermined nozzle whose liquid discharge amount can be changed in accordance with a change in a discharging condition for adjacent nozzles adjacent to the predetermined nozzle.

20 8. The apparatus according to claim 7, wherein said discharge amount control device changes the discharge amount control value for the predetermined nozzle depending on whether or not the liquid is discharged from the adjacent nozzles at substantially the same
25 timing as a discharge timing of the predetermined nozzle.

9. The apparatus according to claim 7, wherein when

the predetermined nozzle is a nozzle B, and the adjacent nozzles are nozzles A and C, said discharge amount control device changes a discharge amount control value for the nozzle B if one of discharging
5 conditions is changed, the discharging conditions being associated with whether a liquid is discharged from at least one of the nozzles A and C at substantially the same time as the nozzle B, a liquid is discharged from at least one the nozzles A and C at a time so near to a
10 discharge time of the nozzle B as to influence the discharge amount of the nozzle B, or no liquid is discharged from either of the nozzles A and C at the time near the discharge timing of the nozzle B.

10. The liquid discharge apparatus according to claim
15 7, wherein said discharge amount control device changes the discharge amount control value for the predetermined nozzle so as to keep the discharge amount of the predetermined nozzle unchanged when a discharging condition for the adjacent nozzles is
20 changed.

11. The apparatus according to claim 7, wherein when the number of nozzles of the liquid discharge head which are to be used is changed, said discharge amount control device changes a discharge amount control value
25 for an end portion nozzle of the nozzles to be used which is located at an end portion.

12. The apparatus according to claim 7, wherein when

a combination of nozzles of the liquid discharge head which are to be used is changed, said discharge amount control device changes the discharge amount control value for the predetermined nozzle which has undergone
5 a change in a use state of the adjacent nozzles.

13. The apparatus according to claim 7, wherein when the predetermined nozzle of a plurality of nozzles of the liquid discharge head becomes a faulty nozzle, and a combination of nozzles to be used changes as use of
10 the predetermined nozzle is inhibited, said discharge amount control device changes discharge amount control values for the adjacent nozzles on both sides of the predetermined nozzle.

14. The apparatus according to claim 7, wherein when
15 a discharge timing of the predetermined nozzle of a plurality of nozzles of the liquid discharge head is shifted, said discharge amount control device changes discharge amount control values for the predetermined nozzle whose discharge timing is shifted and the
20 adjacent nozzles on both sides of the predetermined nozzle.

15. A liquid discharge method of discharging a liquid, to a medium, from a liquid discharge head having a plurality of nozzles including a nozzle whose liquid
25 discharge amount can be changed, comprising:

a discharge amount control step of changing a discharge amount control value including at least one

of conditions of a voltage value of a driving pulse to be supplied to the nozzle and a pulse width with a change in at least one of conditions of a combination of nozzles to be used, the number of nozzles to be used, 5 presence/absence of a faulty nozzle, a direction of relative movement of the head and the medium, and a speed of the relative movement of the head and the medium.

16. The method according to claim 3, wherein
10 the medium has a pixel area partitioned by a black matrix,
the liquid discharge head discharges ink from the nozzle, and
a color filter is manufactured by discharging ink
15 from the liquid discharge head to the pixel area on the medium.

17. The method according to claim 3, wherein
the medium has a pixel area serving as a light-emitting portion,
20 the liquid discharge head discharges an electroluminescence material from the nozzle, and
an electroluminescence device is manufactured by discharging an electroluminescence material from the liquid discharge head to the pixel area on the medium.

25 18. The method according to claim 3, wherein
the medium has an area serving as a conductive thin film portion,

the liquid discharge head discharges a conductive thin film material from the nozzle, and

an electron-emitting device having the conductive thin film portion is manufactured by discharging a
5 conductive thin film material from the liquid discharge head to the area on the medium.

19. The method according to claim 3, wherein
the medium has areas serving as conductive thin film portions,

10 the liquid discharge head discharges a conductive thin film material from the nozzle, and

a display panel including a plurality of electron-emitting devices having the conductive thin film portions is manufactured by discharging a
15 conductive thin film material from the liquid discharge head to the areas on the medium.

20. A display device panel manufacturing method of manufacturing a display device panel by discharging a liquid, to a substrate, from a liquid discharge head
20 having a plurality of nozzles including a nozzle whose liquid discharge amount can be changed, comprising:

a step of changing a discharge amount control value including at least one of conditions of a voltage value of a driving pulse to be supplied to the nozzle
25 and a pulse width with a change in at least one of conditions of a combination of nozzles to be used, the number of nozzles to be used, presence/absence of a

faulty nozzle, a direction of relative movement of the head and the medium, and a speed of the relative movement of the head and the medium.

21. The method according to claim 6, wherein the
5 display device panel comprises a color filter.

22. The method according to claim 6, wherein the display device panel comprises an electroluminescence device.

23. The method according to claim 6, wherein the
10 display device panel comprises a display panel including a plurality of electron-emitting devices having thin conductive film portions.